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# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • DECEMBER 12, 1942



A Glimpse Into The Past

See Page 377

A SCIENCE SERVICE PUBLICATION

## Do You Know?

All the *quartz* for radio crystals comes from Brazil.

A small quantity of *citric acid* is found in cows' milk.

There have been four invasions of *cholera* in the U. S.

The Hupa and Yurok Indians made twine from *iris* leaves.

The average American eats and drinks 12 pounds of *salt* each year.

Next to Greenland, *New Guinea* is the largest island in the world.

A lack of *vitamin C* will show up in the blood plasma in two days.

The Americas have a total *population* of about 250,000,000, almost half of which is in South and Central America.

A method of producing *lactic acid* from grapefruit juice, using discarded fruit, has been patented by two chemists of the U. S. Department of Agriculture.

The United States produces one-third of the world's *iron ore*, 40% of the iron and steel, two-thirds of the oil, 40% of the copper, 29% of the zinc, and 24% of the lead.

Gasoline and rubber shortages are proving a boon to *birds* and small mammals which were killed in tremendous numbers during the days of speeding automobiles.

## Question Box

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Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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Where has a freshwater jellyfish been found? p. 376.

*Quick freezing* of green vegetables preserves 50% more vitamin C than canning.

*Wooden nuts and bolts* may soon be a commonplace, as well as "copper" wire made of silver.

A new word, "*geotechnology*", has been coined to include all the mineral arts and sciences from metallurgy to ceramics.

*Sweet potatoes* have now been added to the list of potential gasoline substitutes being tried out in Africa.

A shortage of *sauerkraut* has been averted by packing it in old-fashioned wooden barrels instead of cans.

New *lead* and *sulfur* deposits have been discovered in the U. S. S. R. in the high plateau of the Pamirs, next to India.

## SCIENCE NEWS LETTER

Vol. 42 DECEMBER 12, 1942 No. 24

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington, D. C. North 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

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Cable address: Scienserve, Washington.  
New York office: 310 Fifth Avenue, CHickering 4-4565.

Entered as second class matter at the post-

office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The Science Observer, established by the American Institute of the City of New York, is now included in the SCIENCE NEWS LETTER.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STate 4439.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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## ENGINEERING

# New Type Locomotive

**First gas-turbine locomotive, made for Swiss Federal Railways, surpasses expectations in early road tests. It is suitable in areas where water is scarce.**

➤ A SHOOTING stream of gas is used to drive the first gas-turbine locomotive which was described at the meeting of the American Society of Mechanical Engineers in New York by Paul R. Sidler of New York, resident engineer of Brown, Boveri & Company, Ltd.

Built for the Swiss Federal Railways, the new-type locomotive has not been tested as thoroughly as desired because of fuel shortage and war conditions. But enough road tests over various tracks have been made, Mr. Sidler pointed out, to demonstrate that the gas-turbine locomotive not only came up to expectations but surpassed them in some respects.

For certain uses it shows marked advantages over the Diesel locomotive, but in general it is not yet a competitor.

"It should be particularly suitable for express service over long distances," Mr. Sidler maintained, "in areas where water is scarce and where there is a considerable difference in the costs of Diesel oil as against ordinary fuel oil."

*Science News Letter, December 12, 1942*

## Plywood More Important

➤ PLYWOOD planes are assuming increasingly great importance in the development of wartime aviation, and a special committee comprising leaders in the fields of aviation, wood technology and other sciences involved in building wings out of wood has been organized to cope with problems arising in the industry, as well as to find new ways of making better aircraft out of this long-neglected but now highly promising material.

Prof. Alexander Klemm of New York University, chairman of the new committee, announced its formation before a meeting of the American Society of Mechanical Engineers in New York. In the same address he pointed out some of the advantages of plywood construction which have led to the recent revival of this type of plane.

Plywood planes, Prof. Klemm stated, are really not new. On the contrary, plywood was one of the earliest mater-

ials used in airplane building. During the first World War fuselages and wings with plywood skins were successfully built both in the United States and France. Subsequently Anthony Fokker, famous Dutch designer, built many plywood planes here for mail and air transport uses. The glue was not decay-proof, however, and when a disastrous accident overtook one of Fokker's planes, plywood construction fell into disfavor and aluminum alloys took the lead away.

The present revival of the plywood plane was traced by the speaker to four principal factors: "First, synthetic resin glues have taken the place of casein and other glues of animal origin, and the new synthetic adhesives are proof against bacteria and moisture, so that decay need no longer be feared.

"Second, the plywood is a substitute for aluminum which has become a scarce

metal under the tremendous impact of war needs.

"Third, the plywood suitably finished is smoother than aluminum skin, even when countersunk rivets are used with the metal.

"Fourth, because the plywood is so much lighter than metal, the skin or cover of the wing can be made much thicker for a given weight. Hence the skin can be much more rigid and resistant to bending, and the wing can be built as a pure shell, with many internal parts omitted."

Another reason for the adoption of plywood, Prof. Klemm pointed out, is that the bag molding process, in which thin strips of veneer are laid over a mold and then set under heat and pressure applied through a rubber bag, is so rapid and simple that a whole fuselage, composed of only two parts, can be built in 24 hours. Thus plywood has advantages or possibilities in weight saving, greater aerodynamic efficiency and cheapness.

*Science News Letter, December 12, 1942*

## Wood in Aircraft

➤ USE OF wood in America's planes is steadily advancing in both quantity and quality, Dr. Robert J. Nebesar, chief



**GRASSHOPPER**—This new model built by the Stinson Division of Vultee Aircraft really does look like a man-made insect although it is nicknamed by the manufacturer a "flying jeep" because it can land and take off on a highway or cow pasture and can fly at less than 45 miles an hour. It is the "Sentinel" or L-5, designed for observation for the artillery, tank corps, cavalry and infantry.



engineer of the Universal Moulded Products Corporation, reported at the meeting of the American Society of Mechanical Engineers in New York.

Aircraft with wooden fuselages and other parts have been shown to withstand shock and vibration very satisfactorily.

"Both servicing and repairs are inexpensive and comparatively easy to take care of," Dr. Nebesar declared, "these presenting no engineering problems."

New durable synthetic glues and ensuing improvements in wood processing, such as molding, pressing, and other techniques, has resulted in an ever-increasing replacement of war-scarce metals by wood in some types of planes.

*Science News Letter, December 12, 1942*

## American Inventions Lead

► INDUSTRIAL progress in America is usually attributed to our natural resources but few people realize that Americans, more than any other people of the world, have been responsible for the epoch-making inventions of the century, A. A. Potter, dean of engineering at Purdue University, declared at the meeting of the American Society of Mechanical Engineers in New York.

Vital, young Americans, initiative spurred by their individual democratic rights being placed above those of the state, have produced some of the greatest of these discoveries, he pointed out. Westinghouse invented the airbrake at 21, for example, McCormick the harvester at 22, and Howe the sewing machine at 27. McCormick with his reaper gave more impetus to mechanized agriculture than any person in any other country, Dean Potter declared.

Among pioneer American inventions in the field of communication have been telegraph, transatlantic cable, telephone and many features of the radio.

From the invention of the *Clermont* by Fulton to the patent for the airplane by Wright, Americans have been major contributors to the field of transportation.

Many manufacturing processes are also included among American achievements, Dean Potter pointed out, such as welding, cracking gasoline, vulcanizing rubber and the manufacture of aluminum and plastics.

Our patent system, which encourages and rewards creative talent, has been a major factor in the industrial progress of this country, Dean Potter declared.

*Science News Letter, December 12, 1942*

## PUBLIC HEALTH

# Child Has Plague

Two-and-one-half year old baby girl in Siskiyou County, California, is expected to recover after prompt treatment with sulfa drug.

► A CASE of bubonic plague in a two-and-one-half year old baby girl in Siskiyou County, Calif., has been reported to the U. S. Public Health Service. This is the first case of plague in humans in the United States since the summer of 1941, when two fatal cases occurred in the same county.

The child is expected to recover, thanks apparently to treatment with sulfadiazine. The report received in Washington states that this sulfa drug was given and does not mention any use of anti-plague serum, although it gives other details of treatment such as the use of codeine to relieve pain and restlessness and injections of fluids to restore those lost because of the sickness.

The report states that the sulfa drug treatment was started following a telephone call to Dr. Karl Meyer, Hooper Foundation, University of California. Presumably it was advised by Dr. Meyer, since he has reported successful sulfa

drug treatment of plague in laboratory animals.

Where the little girl picked up the plague germs is not definitely known. Her father had hauled hay from a region where plague-infected ground squirrels were known to exist, and the child was playing in the hay the day before she got sick. Cats, dogs, mice and wood rats in the barn of the child's home are considered other possible sources of infection, since these might have harbored plague-infected fleas.

Plague-infected fleas and lice were found on Nov. 14 in 12 separate pools of rats and field mice caught in Marin County, Calif., about two miles from the San Francisco Bay area and the Sausalito shipyards. These had no connection with the plague infection in the little girl in Siskiyou County to the north, but indicate to public health officials a potential plague danger to humans elsewhere.

*Science News Letter, December 12, 1942*

## ENGINEERING

# Road Traffic Declines

► GASOLINE rationing, tire shortage and wartime restrictions on travel in general have contributed to a very decided decline in road-borne traffic, John T. Lynch, highway engineer-economist of the Public Roads Administration, told the meeting of the Highway Research Board in St. Louis. There has been a steady decline in number of vehicles of all classes, though the ratio of trucks to cars has risen. A higher percentage of trucks are running without loads, but trucks that do have loads are carrying bigger ones.

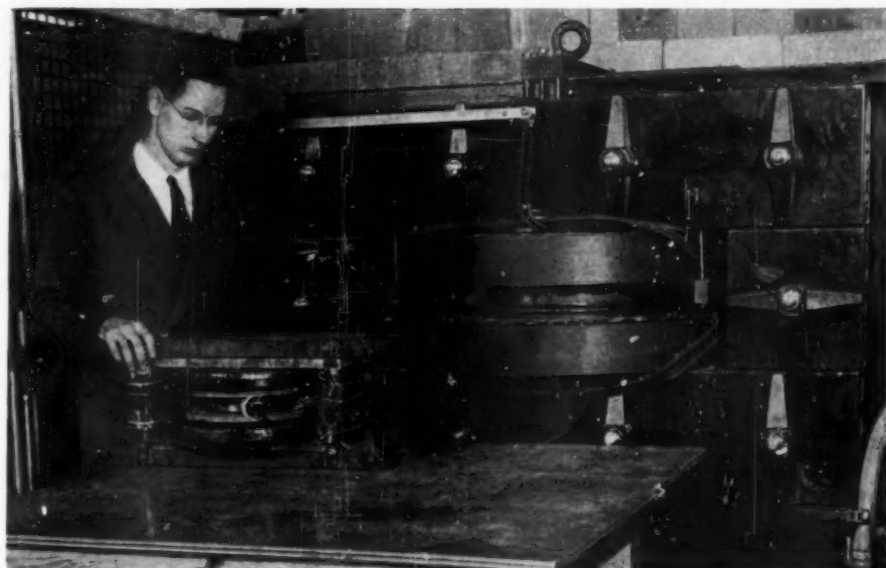
Mr. Lynch reported results of a country-wide survey of country highway travel, in which more than 500,000 vehicles were counted and classified and more than 50,000 trucks were weighed at 486 stations.

Traffic declined steadily from February to August of this year, as compared with figures for the same months in 1941. The decline was checked in Sep-

tember. This was due in part, Mr. Lynch thinks, to the passing of the normal vacation season, which this year was a period of very light traffic because of the large number of persons who did not take their vacations a-wheel.

The increased proportion of trucks running light may be traced partly to the use of light trucks as substitutes for buses and personal cars in getting workmen to their jobs, partly to the fact that many of the trucks were engaged in carrying materials to cantonments, airfields and other places where they had no chance to pick up return loads. The cargoes of trucks that did have loads were so much greater than they had been in pre-war times that despite the decreased number of loads the number of ton-miles of load carried by truck, for the country as a whole, is almost as great as in 1940. In the Pacific Coast region, indeed, it is 22% greater.

*Science News Letter, December 12, 1942*



**NEW USE**—The 20 million volt Betatron shown in the background of this picture has new possibilities in the fighting of malignant growths in the human body. Prof. Donald W. Kerst, University of Illinois, shown holding the first Betatron, built in 1940, has just reported that the electron beam from the instrument may be even more valuable than the high-voltage X-rays produced with it, for malignant growth therapy.

#### MEDICINE

## Betatron for Medical Use

Electron beam, as well as high voltage X-rays may be used in treatment of human malignant growths. No tests yet on living tissue.

► THE NEW atom-smashing Betatron, most powerful X-ray in the world, may become a first-rank medical weapon for destroying malignant growths within the body, Prof. Donald W. Kerst, who developed the Betatron at the University of Illinois, told members of the Radiological Society of North America in Chicago.

Mankind's most dreaded disease enemy might be attacked by this new blitz weapon in either of two ways: first, by use of its 20-million-volt X-rays, and second, by using directly the electron beam which makes the X-rays.

The new machine is not yet ready for use in treating patients, Prof. Kerst cautioned, and no tests with it have as yet been made on living tissues. He and his assistants, Philip Morrison and H. W. Koch, have, however, measured the penetration of the X-rays and electron beams through material equivalent in absorbing power to tissues. These tests show that, unlike the 400,000 volt X-ray

machines now used to attack malignant growths, the rays from the Betatron would produce their maximum effect about one and one-half inches below the surface of the body instead of at the surface. This means that the killing rays would have little effect on the skin and fat beneath it, but would deliver their full blitz effect on growths within the body.

"Sending the electrons directly into the patient is the most promising way to use the Betatron for therapy (treatment)," Prof. Kerst said. "At 20 million volts these electrons will penetrate as far as 10 centimeters (about four inches) and no farther. Thus there is no damage beyond the area of treatment."

The Betatron, developed as a high-voltage atom-smasher for research in atomic physics, is a compact machine and relatively inexpensive for the voltage produced. It is about the size of an office desk, and has a control panel and condenser bank, each of about the

same office desk size, and a motor generator. It is thus smaller than many X-ray machines of considerably less voltage now in use and requires about the same amount of power for operation.

The Betatron described is the second of its kind. Prof. Kerst built the first one over two years ago in his laboratory at the University of Illinois. This one was built under his direction by the General Electric Company.

*Science News Letter, December 12, 1942*

#### ENGINEERING

## Research Saves War Metals; Aids Sub-Zero Operations

► MORE THAN 10 million pounds of nickel, chromium and molybdenum will be saved next year in the production of medium tanks alone, through engineering research of the Society of Automotive Engineers' War Engineering Board, it is reported in the December issue of the organization's technical journal.

Cooperation of industry and the military, through research sponsored by the Board, is expected to produce other large savings. Materials conservation is now being incorporated in the designs and specifications of new army equipment.

Use of low-grade metals is being expedited to release the better alloys for more critical uses.

Recent piece-by-piece study of military motor vehicles, conducted by the Board, involving thousands of parts, reduces consumption of vital materials, such as rubber, aluminum and cork, and utilizes suitable substitutes.

Development of cold-starting aids for military motorized equipment is among the current projects, the journal reports. Sufficient progress has been made to supply the Army with satisfactory expedients for this winter. Plans under way are expected to make American armed forces the world's best equipped for sub-zero operations.

Other research projects contemplate development of equipment for the American army and navy which will assure satisfactory service in any climate in the world, with both production and servicing using a minimum of materials.

An "interim" secondary butyl tire has been developed by a committee created by the Board, which appears capable of 15,000 miles of service and satisfactory for synthetic recapping materials. Manufacturers are cooperating in laboratory and field tests with the idea of making the material available for use in 1943.

*Science News Letter, December 12, 1942*

## PHYSICS

# Microscopes Improved

**New portable models will make electron microscope available for wider usefulness in small laboratories and in war industries.**

► **ELECTRON** microscopy, newest of research techniques, is hardly more than a decade old, yet even at this knee-pants age in years it is showing decided signs of maturity.

One such sign is the development, by General Electric and Radio Corporation of America respectively, of smaller, simpler, more easily used, and presumably much cheaper instruments. They are described as of ordinary laboratory table height instead of the towering seven feet of the types now in use, not too heavy to trundle around the laboratory on wheels and (best of all) producing their image in such a position that the user can sit in unstrained comfort and make his study at leisure.

The General Electric instrument can be plugged into ordinary 110-volt house current and uses electrostatic lenses to focus the beam of electrons, instead of the electromagnetic type ordinarily used in electron microscope work, whereas the R.C.A. instrument retains the electromagnetic lens and wider range of magnification. Specimens can be photographed outside the vacuum chamber instead of in the vacuum as was the case in former instruments. Time required to obtain the vacuum necessary for electron microscopy has been reduced to a few minutes and operations have otherwise been made as simple as possible, Dr. Simon Ramo of the General Electric Electronics Laboratory explains.

The new simplified model is expected to bring electron microscope work into schools and small colleges after the war, but their use at present will largely be limited to war projects.

Research has been limited by the fact that only about forty of the big expensive models are in operation. This bottleneck will be broken by adoption of the newly developed instrument, scientists assert, and much work awaits their production.

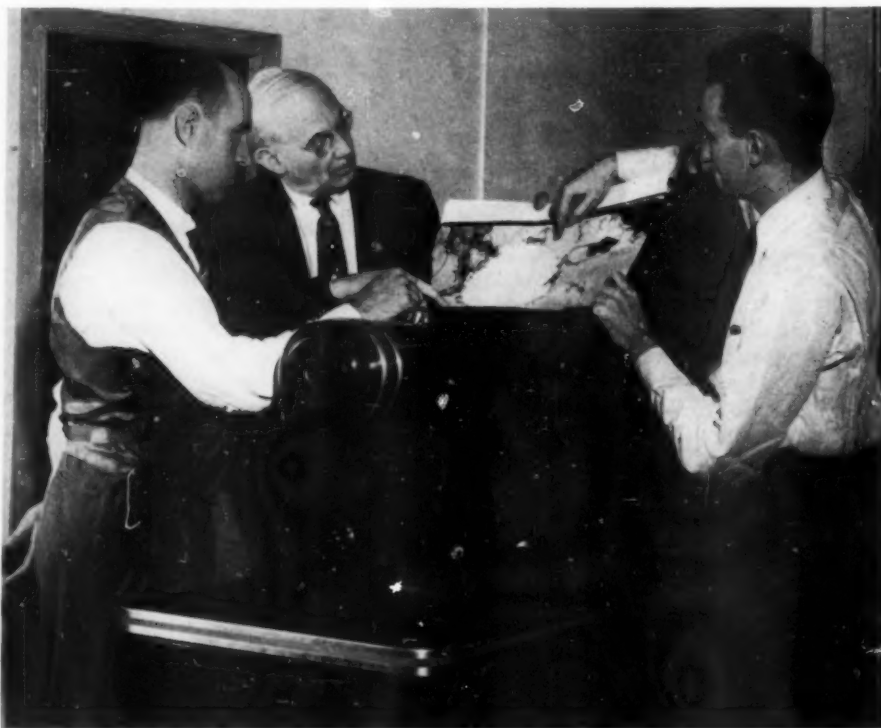
This is reminiscent of the evolution of other laboratory gear that was originally both cumbersome and costly, but is now convenient standard equipment

in all well-equipped research and teaching laboratories. A century or so ago, compound microscopes were a couple of feet or more in length; now they are of convenient desk height and so light that they can easily be lifted with one hand. The X-ray apparatus of a generation ago filled whole rooms with its cumbersome complexity and was very temperamental; now every field hospital has its truck-mounted unit that a man with sergeant's chevrons operates as a routine matter. The electron microscope seems to be going through a similar evolution very rapidly.

Another sign of approaching maturity is the nascent formation of a society of users of the instrument. Microscopists

long ago formed their professional associations, so did roentgenologists in our fathers' time. One of the features of the recent National Chemical Exposition in Chicago was a get-together of electron microscopists. They did not immediately elect officers and adopt a constitution; but there is little doubt that the near future will see the formal emergence of an American Society of Electron Microscopists.

Such societies promote the professional interests of their membership in a number of ways. They hold meetings once or twice a year, where papers are presented and discussed, to bring out results of work done since the last meeting. They edit an official journal, in which research results are published. (Such a journal was strongly "talked up" at the Chicago meeting.) Perhaps most important of all, little knots of their members cut sessions at the annual meetings, get together around a table somewhere, and talk shop until the air is blue. That's the busman's holiday raised to the *n*th degree—and it's the grandest fun in the



**MOBILE**, small and operating on ordinary house current, the new General Electric model of the electron microscope shown in the picture is 10 times as powerful as the best light microscopes. Examining an electron micrograph taken under the new instrument are (left to right) Dr. C. H. Bachman, co-designer; William C. White, head of the GE electronics laboratory; and Dr. Simon Ramo, co-designer.





**"VEST POCKET SIZE"**—RCA has now produced this portable model of the Zworykin electron microscope, instrument which has made visible the secrets of the submicroscopic world. Its convenient size and low price will make it available to small laboratories and of much wider usefulness in the war effort.

world if you know the field. To this, it would seem, the scientists who work with the world's newest super-

eye, the electron microscope, are surely coming.

*Science News Letter, December 12, 1942*

#### ENGINEERING

## Small Battleship Plan

Designs for vessel with half a big battleship's fire power on only a third of its displacement are circulated for criticism.

► BATTLESHIPS, reasserting themselves in the latest phase of the Solomon Islands fighting, as well as in the covering force at the landing in North Africa, seem to be coming out of the eclipse into which aircraft carriers were forcing them a few months ago. In an effort to gain some of the advantages of their heavy gun-power and strong armor protection without tying up so much naval investment in so few giant units as those composing present-day fleets, two young naval architects, W. E. Strope of the Navy's Bureau of Ships and S. J. Dwyer of the Federal Shipbuilding and Dry Dock Company, have offered for discussion, through the Society of Naval Architects and Marine Engineers, a set of plans for a capital

ship of relatively small displacement that still carries armor of standard thickness and guns of full battleship-battery caliber.

The standard displacement chosen, 15,000 tons, is only one-third that of the new Iowa class, but is still about as great as that of any pre-dreadnaught battleship. Armor of main belt, conning tower and battery position is 14 to 18 inches thick. Two armored decks and careful subdivision of the hull provide protection against bombing and torpedo attacks. There are two turrets, each mounting either three 14-inch or two 16-inch guns.

This provision of half a big battleship's fire power on only a third of its displacement had to be paid for with

something; in this case speed and secondary armament are sacrificed. Speed is held down to the World War I battleship's 21 knots. Secondary batteries consist of only six 5-inch dual-purpose guns and four multiple pompoms. It is expected that additional anti-aircraft fire will be provided by accompanying destroyers or cruisers.

On the whole, the design is conservative, even conventional. However, there is one radical departure, in the arrangements for venting smoke. Instead of the bomb-inviting smokestack amidships, there are smoke conduits running along the sides, behind the armor belt, and opening through tandem stub stacks on the after deck. Even for this, however, there is precedent in the side-wise sweep of the uptakes on present-day aircraft carriers.

The designers do not undertake to discuss possible tactical uses of ships of this type in detail. However, they do suggest their possible usefulness in protecting large convoys against the attacks of heavy cruisers and even of battleships. They suggest also that they would be well adapted for the naval defense of South American countries that now have to choose between fast but ill-armored, lightly armed cruisers and unnecessarily big and costly battleships.

In this latter possible role they have some resemblance to the coast-defense ships built by the Scandinavian powers, which carry moderately heavy armor protection and heavy cruiser-caliber guns on about half a cruiser's displacement. They represent a decided advance over the German "compromise ship," the pocket battleship, which was a hybrid between cruiser and battleship in everything: gun caliber, armor, speed, internal protection. As weighed in the crucial balance of actual combat, the pocket battleship proved wanting. By choosing full strength at some points and accepting handicaps elsewhere, the small-displacement battleship might very well make a better showing.

*Science News Letter, December 12, 1942*

The use of *hybrid seed* added 300 million bushels to the nation's 1942 corn crop, the U. S. Department of Agriculture estimates.

The *Latin American republics*, extending 8,000 miles south and east of the United States, cover an area almost three times as large as the continental United States.

## MEDICINE

**Blood Plasma Given To Burn Victims**

► THE SULFA drugs and blood plasma rushed by plane to surviving victims of the Boston night club fire are potent medical weapons for fighting the infection, shock and blood-fluid loss which threaten the lives of severely burned persons.

Enormous amounts of plasma may be given. One authority states that a person suffering from burns should get about a quart of plasma daily for each 10% of the body surface burned. This must be given till all signs of shock are gone and no more plasma is being lost from the burned surfaces or is leaking from the blood vessels into the tissues.

Plasma rather than whole blood is given to burn victims because it is the fluid part of the blood, not the cells, which escapes in such cases. Giving whole blood would dangerously increase the concentration of the blood cells.

Latest sulfa drug treatment for burns consists of covering the burned surface with a film of methyl cellulose containing sulfadiazine. Previously, the sulfadiazine alone was sprayed onto the burns. It gave good results in preventing infection, allaying pain and speeding healing. But the film it formed was so fragile and the solution dried so slowly that now methyl cellulose is mixed with the sulfa drug to make a stronger film which can be put on like a bandage.

*Science News Letter, December 12, 1942*

## MEDICINE

**Hay Fever Patients Helped by Vitamin C**

► DAILY doses of anti-scurvy vitamin C brought great relief to almost all of a group of 25 hay fever sufferers during the last ragweed season, Dr. Harry N. Holmes and Wyvona Alexander of Oberlin College report (*Science*, Nov. 27).

"Apparently there was distinct gain with 88% of the patients," they state.

In the experiments three levels of daily dosage were tried, 100 milligrams, 200 milligrams and 500 milligrams. The normal daily requirement of a moderately active man was set at 75 milligrams by the National Nutrition Conference. On the 100 milligram dosage, five patients made a noticeable gain after one week.

Twelve gained decidedly after a week on 200 milligrams daily, and eight reported remarkable improvement after three or four days at the 500 milligram level.

The vitamin C treatment was tried after it had been observed for several years that the vitamin C level in the body was lowered during hay fever attacks. Other workers had meanwhile developed the theory that histamine, a chemical normally found in the blood, is thrown into the blood stream in excessive amounts during allergic attacks and accounts for some of the unpleasant symptoms. Dr. Holmes found that histamine reacts with vitamin C under certain conditions, suggesting that this excess histamine may be reducing the vitamin C level in patients with hay fever.

Dr. Holmes recommends that pharmaceutical firms prepare 250 milligram tablets of vitamin C, or capsules to be emptied on the tongue in order to lower the cost and simplify the dosage.

"The patient (after consulting the family physician, as was done in our own recorded experiments) would do well to begin with a daily 250 milligram dose and if no decided improvement results after one week, to try 500 milligrams daily until satisfactory progress is observed. After that he might get along comfortably on 250 milligrams or less during the season," he advises.

Irritating effects are rarely observed though one of their patients reported a rash. If the acidity of vitamin C is objectionable, it can be mixed with baking soda. The vitamin, found in such foods, as fresh fruits and vegetables, especially the citrus fruits, tomatoes and cabbage, was given in the form of ascorbic acid in the Oberlin experiments.

*Science News Letter, December 12, 1942*

## PHYSIOLOGY

**Experiments Show Vitamin B<sub>6</sub> Needed by Pigs**

► PIGS as well as people need their vitamins. Newest need on the porcine diet list is pyridoxine, member of the vitamin B complex, also known as B<sub>6</sub>, experiments performed by Prof. E. H. Hughes and R. L. Squibb of the University of California College of Agriculture indicate. Lack of this compound caused a number of distressing (and costly) symptoms, including loss of appetite, poor growth, fits and anemia. Normal health was restored to the porkers by daily doses of a mere pinhead quantity of pyridoxine—five milligrams per hundred pounds of pig.

*Science News Letter, December 12, 1942*

## IN SCIENCE

## ZOOLOGY

**Freshwater Jellyfish Reported in South America**

► FIRST DISCOVERY of a free-living freshwater jellyfish in South America is reported (*Science*, Dec. 4), by Prof. Carlos E. Porter of the National Museum at Santiago, Chile. He found them swimming in a small body of fresh water in the Province of Valparaiso, over 20 miles from the sea. He sent specimens and a sketch to Dr. Waldo Schmitt of the U. S. National Museum in Washington, D. C., who identified them as belonging to a species already known from Europe, Asia and North America, but not previously found under natural conditions closer to Chile than Panama.

*Science News Letter, December 12, 1942*

## ENGINEERING

**Future Trains to Have Improved Locomotives**

► SPEEDING trains of the future will be powered by diesel-electric locomotives which will far surpass anything that we have yet seen, B. S. Cain of General Electric's locomotive engineering department predicted at the meeting of the American Society of Mechanical Engineers in New York.

Design progress has not stopped despite standardization required by the war, he declared. Instead, war research has produced power plants with greater power in less space with less weight and designed for mass production. When peace comes, locomotive builders are ready to adapt these developments to railroad use, Mr. Cain said.

Production for the duration is limited to existing standard sizes and types best suited to wartime needs and emphasis is placed on the most efficient use of the limited material available.

Use of small diesel-electric locomotives in industrial service has increased tremendously, Mr. Cain pointed out. These high-speed 150 to 500 horsepower engines are not in as great demand for implements of war as the large low-speed machine.

*Science News Letter, December 12, 1942*



# WILDERNESS FIELDS

## ZOOLOGY

### New Museum Exhibits Show Old Wild West

#### See Front Cover

► VIVID glimpses into America's old West are given to the present generation, that knows it only as stories that old people tell, by two new exhibits which have just been opened to the public at the American Museum of Natural History in New York. In one, a typical scene from the North Platte river country shows beautifully mounted specimen groups of bison and pronghorn, as they were before white men's rifles, followed close by their even deadlier plows, reduced the bison herds from an estimated 60 millions to a few precariously surviving hundreds. In the other, a group of wapiti or American elk are shown in a typical Rocky Mountain environment of Engelmann spruce, aspen, choke-cherry and Oregon grape, all rich in autumn colors. Actual animal and plant specimens in the foreground have been expertly blended with the painted background.

*Science News Letter, December 12, 1942*

## NUTRITION

### More Vitamins from Fish Livers By New Process

► THE COD and other fish whose liver oils furnish vitamins A and D for babies and growing children may be made to yield other vitamins now wasted which could be used for animal or poultry feed or feed supplement.

A patent on a process for recovering these otherwise wasted vitamins has just been issued to Clarence Walter Whitmoyer and William James Moore, of Myerstown, Pa., who assign their patent rights to the Whitmoyer Laboratories, Inc., at Myerstown.

Vitamins A and D are in the oily part of the fish livers, but water soluble vitamins, such as some of the B vitamins and vitamin C, are also contained in animal livers. To save whatever water soluble vitamins the fish livers contain

from being destroyed or discarded when the oil is extracted, the inventors developed a process for mixing the fish livers with a pectin-containing substance. When minced or ground livers are mixed with such a substance, the water in the liver, together with the vitamins it contains, will be held in the pectin-containing substance.

The pectin-containing substances preferred by the inventors for this purpose are such waste by-products as pomace of sweet potato, tomato and citrus fruit.

"Such an end product," they state, "has proved of great value for feeding poultry, since it may be made to contain water soluble and oil soluble vitamins and particularly the vitamins which promote health and growth, as well as carbohydrates, fat, animal and vegetable proteins, organic minerals and the like."

*Science News Letter, December 12, 1942*

## PHYSICS

### Infra-Red Rays Dry Fabrics After Dyeing Process

► INFRA-RED rays, invisible waves of energy in its purest and most concentrated form, are now being used to dry textiles after dyeing and finishing processes, George Fisher, of the Infra-Red Ray Equipment Corporation reported at the meeting of the American Society of Mechanical Engineers in New York.

Bombarding fabrics with the rays produces great heat, although infra-red waves themselves are not hot. This property of the rays has been known for some time, but application in the textile industry has only recently been made.

"Use of infra-red rays produced by gas-heated incandescent refractories has passed the experimental stage," Mr. Fisher declared. "Quite a number of such installations are in industrial operation, performing with excellent results."

Since the rays do not heat the surrounding air, the high-speed production of large amounts of heat energy occurs right at the spot where the heat is needed. Operation has proved very economical, Mr. Fisher pointed out.

Steam heat, formerly used, could not be controlled as well as the new method and as a result the fabric was sometimes excessively exposed to heat and baked. Atmospheric burners and other gas-flame units which have been in use, wasted much heat to the surrounding air and had other features which prevented drying as efficiently as by the infra-red ray method.

*Science News Letter, December 12, 1942*

## GENERAL SCIENCE

### AAAS Postpones Meeting Scheduled for New York

► THE TRADITIONAL meeting of the American Association for the Advancement of Science in the week between Christmas and New Year's, scheduled for New York this year, has been postponed indefinitely at the request of the Office of Defense Transportation, Dr. F. R. Moulton, permanent secretary of the A.A.A.S. has announced.

Marked with sessions of some fifty sections and affiliated societies, these annual meetings have been a culmination of the year's scientific progress.

Not since Civil War days has an annual Christmas meeting been missed. Annual meetings were dropped 1861-5, and earlier a session scheduled for Cleveland was cancelled because of a yellow fever epidemic in the southern part of the country.

The one Christmas of U. S. participation in the first World War, 1917, saw a A.A.A.S. meeting in Pittsburgh, despite transportation difficulties. The president that year, the late Dr. T. W. Richards, Harvard Nobelist in chemistry, did not attend this meeting because he felt that it should have been postponed in the interest of the war.

Last year the annual meeting, coming only three weeks after Pearl Harbor, was held as scheduled at Dallas.

Most of the scientific societies that are scheduled to meet with the A.A.A.S. at New York are expected to cancel their meetings, although some may attempt curtailed business sessions.

*Science News Letter, December 12, 1942*

## GEOPHYSICS

### Geophysicists Skeptical About New Telegraph

► GEOPHYSICISTS have adopted a Missourian attitude regarding the claim of a Cuban inventor that he has devised a telegraphic set-up that will operate on atmospheric electricity alone. There are always slight currents flowing between earth and air, and by an antenna arrangement these might be harnessed to a sufficient extent to operate very sensitive instruments over short distances—say a few hundred yards, or a mile or so at most. Unwilling to reject the claims out of hand, the scientists were equally unwilling to accept them without further evidence, especially in the field of long-range communication.

*Science News Letter, December 12, 1942*

## PSYCHOLOGY

# Preventing Air Sickness

Since air sickness, seasickness and other forms of motion sickness are so largely due to mental causes, you can learn to be sick and also learn to avoid it.

► AIR SICKNESS can be prevented or cured if you know how. So can seasickness and the other kinds of motion sickness that attack men lurching over battlefields in tanks and jeeps, or pitching and heaving in little assault barges or PC boats.

For although the basic cause of air sickness is the effect of certain types of motion on the balancing mechanism of your body, and no one with normal ears is entirely and permanently immune, most air sickness is due to psychological causes. You can learn to be chronically air sick. And you can learn to avoid it.

How to learn, yourself, to be air-worthy is told in a new bulletin just being issued to aviation students and others by the Civil Aeronautics Authority. It was prepared by Marjorie Van de Water, *Science Service* Psychology writer, from information obtained by Dr. G. R. Wendt, who has made a study of air sickness as member of the National Research Council's Committee on Selection and Training of Aircraft Pilots.

Many different things contribute to air sickness besides the motion of the plane itself, the Bulletin explains. Use of the eyes in instrument watching or in reading, noises, smells, constipation, temperature (high or low) and previous indiscretions of eating or drinking, are among the many factors that may contribute to motion sickness. A man has been made airsick while still standing on the ground in an airport, just by hearing the noise of the motor tuning up. It is possible to be airsick in perfectly calm weather; you can be seasick on a placid river.

## Chief Cause in Ear

We carry the chief cause of motion sickness around in our own ears. Besides the hearing apparatus, the inner ear contains a mechanism that makes it possible to perceive motion of body from side to side, up and down, or backward and forward—to sense any tipping or turning of the body and restore its balance. The arrangement in each ear for doing this is a set of horseshoe-shaped tubes filled with fluid and attached to

a membranous sac. There is one set of three tubes for each ear, placed in three different planes, one horizontal and two vertical at right angles to one another, so that, whichever way the head moves, the fluid in at least one tube moves.

When the liquid is disturbed in these tubes by the rotational movement of the body, back pressures are set up which move nerve fibers in the junctions of the tubes. These, in turn, set up impulses which are transmitted to the brain.

There are also other nerve fibers in the inner ear which are weighted with tiny bony particles. When you move up and down in air bumps or in any straight-line direction, these weighted fibers are bent and send their messages to the brain.

It is by these means that we are able to maintain equilibrium. Continued disturbance of these organs causes sickness, because the nerve messages go not only to the part of the brain that tells you whether you are upright, but also to the

part of the brain that controls vomiting. The susceptible man's weakness, it is interesting to note, is not in his ears, as might be supposed. It is the vomiting mechanisms of his brain that are abnormally sensitive.

Jolts don't make you sick. You do not get seasick as you run or jump.

Only long movements cause sickness; violent motion without long phases does not cause it. Long and violent motion is worst.

In an airplane in ordinary straight flight, it is usually the up and down movements caused by bumpy air that produce air sickness.

## Combat Maneuvers Worst

In pilot training, however, the worst motions are not those caused by bumpy weather, but those encountered in the various acrobatic maneuvers — spins, stalls, spirals, slow rolls and so on. The cadet should be introduced to such motions carefully. A little caution at this point may prevent a complete washout on account of chronic airsickness later when a great deal of time and money have been invested in the man's training.

Alcoholic hangovers, constipation and



**AIR SICK?**—In rough flying weather, the passengers in an airplane, including parachute troopers and airborne infantry are more likely to be subject to air sickness than is the pilot. This makes the problem a serious one in modern warfare.



**WHERE TROUBLE STARTS**—It is in the balancing mechanism of the inner ear that air sickness has its beginnings. In turns, loops, and other combat maneuvers as well as in the "bumps" of rough weather, the fluid in the semicircular canals is disturbed. This, in turn, disturbs nerve fibers, which transmit impulses to brain areas which control vomiting.

bad colds are very important in inducing air sickness. Extreme fatigue, overeating or other physical upsets may contribute when they are present—anything which in itself would tend to produce nausea is aggravated in its effects when combined with the motion of an airplane or other vehicle. Altitude may bring on motion sickness.

But the part played by most of the host of other sights, sounds, smells, and feelings that bring on motion sickness is due, not so much to the nauseating qualities of the troublesome sensations themselves, as it is to their previous association with an attack of motion sickness.

### Can Learn Resistance

The most encouraging thing about curing or preventing motion sickness is the fact that individuals can learn to be motion sick or can learn to be resistant to it.

The learning is of the simple, direct kind known to psychologists as conditioning—you may not even be aware of learning. But when you are violently nauseated, everything around you at that time and the things you were doing just previously become so linked with the nausea that they, too, get the power to make you ill.

If you are sick while you are drinking a cup of cocoa, the taste or odor of cocoa may nauseate you thereafter. If you have been sick in an airplane, just the sight of the interior of a plane, the

noise of the propellers, the smell of passengers' baggage, the view of the landscape below or any other seemingly irrelevant details may serve to make you queasy.

Most potent of all these acquired causes of motion sickness are, of course, the sight, sound and smell of sickness.

### Memory Sets It Off

Another powerful trigger for setting off nausea is the memory of sickness. For this reason, any sort of bodily discomfort—heat or cold, improper ventilation, an over-full stomach—that draws the traveler's attention to his own body and how it feels may remind him of previous motion sickness and help to bring on an attack.

The expectation that you will be sick acts in a similar way. It is for this reason that it helps if you keep the mind diverted from how you feel.

A pretty hostess on an airliner, by talking to the male passengers, can do more good than would any medicine. On the other hand, a hardened traveler or a solicitous friend can talk a person into being sick. And you can talk yourself into it if you are apprehensive.

Motion may also induce sickness by this sort of learning. The person who has had experience with sickness in an airplane may then be nauseated in perfectly smooth flight because he has associated ordinarily harmless motions with his nausea.

Forgetting motion sickness is the cure for it.

This does not mean, entirely, taking the mind off it by diversion from body sensations, although that certainly helps. Mainly it means repeated travel, without experience of sickness, in the airplane, ship, or whatever vehicle causes the trouble.

Every trip made without sickness increases tolerance for motion. Every trip on which sickness is experienced makes the person more susceptible.

### Rules for Prevention

Prevention and cure of motion sickness both depend on repetition of trips successfully made without nausea. To accomplish this: 1. Make short trips at first. 2. Make initial trips only in fine weather. 3. Don't try acrobatic maneuvers with an inexperienced flyer. 4. Until tolerance is established, don't fly when upset by hangovers, fatigue, constipation, unwise eating or minor illnesses.

As the individual's experience increases, his tolerance increases, so that he can expose himself to longer and rougher flights without illnesses. Eventually he may become capable of making flights under all sorts of operational conditions.

The student can help himself to build up tolerance to flight motions by getting used to similar motions on swings and various amusement park devices. He should always be careful not to continue the rides until he is made sick by them. He should do it for fun, not with a grim determination to grin and bear it.

Favorite remedies for preventing motion sickness may also be valuable because they lessen expectation of sickness. Many passengers have their own ideas about helpful measures, such as eating lemon or chewing gum, and each one is usually right about it for his particular individual case. The same pet remedy might not help another person.

### Light Refreshment Helps

Taking a bit of food or drink may also help, largely because it is a pleasant practice. It helps especially if taken on the ground just before taking off or during a short trip.

Still another result of experience with the motions of any vehicle is that they are no longer unexpected. It becomes possible to anticipate the motions unconsciously and brace yourself or compensate for them more or less automatically.

*Science News Letter, December 12, 1942*



## INVENTION

# "Mincing" Feathers

New process developed by Department of Agriculture scientist may help out in present acute shortage of goosedown needed for war uses.

► A NEW process for "mincing" feathers, developed by Dr. John I. Hardy of the U. S. Department of Agriculture, promises to help out in the present acute shortage of goosedown, badly needed for filling aviators' jackets, pillows for hospitals and other essential war services. The United States used to import about three million pounds of goosedown a year from Europe; now, with greatly increased need, it is getting scarcely a third that much.

Dr. Hardy's treatment of feathers is relatively simple. After being dried and cleaned, they are put into a special mill, which breaks the barbs away from the midribs and cuts them into short pieces. These cling to each other with thousands of microscopic hooks, forming a loose, fluffy structure. The "minced" feathers are separated from the midribs by blowing them upward in tall towers. The light bits float over into a large container, while the heavier midribs fall short.

Dr. Hardy conservatively declines to regard his product as a replacement for the scarce goosedown, but states that it can be mixed with the down and make it go much farther.

In the Department's great Western Regional Laboratory at Albany, Calif., chemical utilization of feathers is under investigation. Feathers are basically keratin, the same protein substance that makes up horns and hoofs, traditional material of animal glue. Feather glues have been tried out, especially in the bonding of plywood. Molding plastics made from feather keratin also look promising.

In one experiment, the gluey protein was even drawn out into filaments that could be spun into a yarn resembling wool. Work along the lines of feather-thread fabrics, however, has not yet been very extensive.

In the meantime, the Department of Agriculture is encouraging all possible use of feathers as such. Demand for domestically produced feathers has hitherto been far below the supply, so that a large part of the feathers from poultry packing establishments has been only a troublesome waste. Now, goose and duck feathers are carefully saved for

the armed forces; chicken and turkey feathers go into civilian use.

A smaller possible source, but one yielding choicer feathers and down, is being opened up by a sportsmen's organization, Ducks Unlimited. They want hunters everywhere to save all down and short feathers from the birds they kill, and mail them to Ducks Unlimited, 83 Columbia Street, Seattle. They state that they will market everything so received through regular channels, and that all money realized will be turned over to the proper authorities for the establishment of waterfowl nesting refuges.

*Science News Letter, December 12, 1942*

## PUBLIC HEALTH

## National Health Picture Reported "Pretty Good"

► THE NATIONAL health picture is "pretty good," with no signs of any epidemics, according to reports of communicable diseases received weekly by the U. S. Public Health Service.

The death rate in large cities has shot up some 12% or 13% in recent weeks, chiefly because of influenza and pneumonia. Death rates from these two diseases are higher than the three-year average established by the Service for basis of comparison since the introduction of the sulfa drugs which have so greatly reduced pneumonia deaths.

Cases of influenza reported by state health officers have also been increasing, from 1,596 for the week ending Nov. 14 to 1,851 for the week ending Nov. 28, latest on which figures are available. About 60% to 70% of the cases for the last three weeks were reported from Texas, South Carolina and Virginia. So far, however, no signs of an influenza epidemic have appeared.

Meningococcus meningitis cases have been running higher all this year than during any year since 1937. Total number of cases for the week ending Nov. 28 were 89, an increase of 25 over the number reported for the previous week. The five-year median figure runs around 30 cases per week for the nation. Only

17 cases have been reported from the nine service commands of the Army. Although the total number of cases in the nation is higher than usual, it does not represent any particular outbreak.

The largest number of cases of epidemic typhus fever ever reported to the Public Health Service will probably be reported this year. More than 3,300 cases have been reported so far this year, most of them from Texas and Georgia. The federal health service has been receiving reports on this disease since about 1930. Endemic typhus fever in the United States is a mild disease, spread by the rat flea, and not to be confused with the highly fatal European typhus fever.

*Science News Letter, December 12, 1942*

## MEDICINE

## Gorgas Medal Honors Three Military Doctors

► FIRST to receive the new Gorgas medals, awarded by the Association of Military Surgeons of the United States, will be three military doctors who have made outstanding contributions to the protection of the health of the armed forces.

The medals, each accompanied by a check for \$500, will be presented at a luncheon in Washington on Dec. 15 to Brig. Gen. Jefferson Randolph Kean, U. S. Army, Brig. Gen. Frederick Fuller Russell, U. S. Army, and Rear Admiral Edward Rodes Stitt, Medical Corps, U. S. Navy, all retired.

General Kean will be cited for his aid in conquering yellow fever by initiating warfare in Cuba against mosquitoes in 1900; General Russell for first immunizing the entire Army against typhoid fever and thus reducing the peril from this disease to a minor problem; and Admiral Stitt for extensive research and writings on tropical diseases and their prevention.

The medals were established by John Wyeth and Bro., in memory of Surgeon General William Crawford Gorgas whose work in preventive medicine made possible the construction of the Panama Canal. They will be presented by Col. Edgar Erskine Hume, vice-president of the Association of Military Surgeons and acting chief executive officer of Carlisle Barracks, Carlisle, Pa., where the Army maintains its Medical Field Service School.

Mrs. Aileen Wrightson, daughter of General Gorgas, will be guest of honor and receive a courtesy medal.

*Science News Letter, December 12, 1942*



## More bombs for Berlin . . . more terror for Tokio

**I**N TOTAL WARFARE, every pound of metal we can save means just so much added destruction we can hurl at the enemy.

7000 tons of steel saved means approximately 70,000 more heavy bombs to drop on Berlin and Tokio.

2500 tons of copper saved means nearly 1,000,000 additional 3 in. A. A. cartridge cases for blasting Zeros and Messerschmitts out of the sky.

Westinghouse will save these huge amounts of steel and copper during 1942 in its Transformer Plant alone . . . because of *radical improvements in transformer materials and design* that have come out of the Westinghouse Research Laboratories and Westinghouse engineering:

**An entirely new kind of transformer steel** wherein the crystals line up like tenpins in a row, instead of in helter-skelter fashion as in ordinary silicon steel. This new grain-oriented steel . . .

called Hipersil . . . is the result of nine years of intensive study and experiment by Westinghouse Research Engineers.

Hipersil has *one third* more flux-carrying capacity than the best grade of ordinary silicon steel. Because of its higher permeability, less Hipersil core material is needed. Transformer weight may be reduced *25 to 30 per cent*. Hipersil, alone, will save thousands of tons of critical steel and copper in the vast number of transformers Westinghouse will make during 1942.

**Forced oil-cooled transformers** in which the cooling medium is rapidly circulated inside the transformer shell. This means quicker heat removal. Smaller cores and coils can do a bigger job. Strategic steel and copper are saved to help win the war.

**Copper temperature control.** Here a liquid-cooled transformer carries a load up to the point where the copper reaches a critical temperature, beyond which the insulation may be damaged. By the use

of this thermal control, higher safe loads can be carried. A transformer of a given size, therefore, does *more work* . . . another way of saving steel and copper for more shells and tanks and ships to hurl at the Axis.

Westinghouse makes transformers in a wide variety of sizes . . . from tiny units for use in portable "Walkie Talkie" radio sets to high power transformers as big as a six room house: these latter transformers weigh 257 tons. As a further example of the economy in strategic materials effected by Hipersil 40 tons of steel and 4 tons of copper are saved through the use of this new magnetic material in the construction of such a transformer.

Better transformers go hand in hand with these major achievements of Westinghouse "know how" in saving strategic materials for our all-out drive to victory.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pennsylvania. Plants in 25 cities. Offices everywhere.

# Westinghouse



. . . making Electricity work for Victory



"Buy British!"

► **REALLY GOOD** Americans will "buy British" when shopping for holly. That isn't a gesture of friendliness to our ally in the present world emergency. As a matter of fact, the English holly now found on American market stalls is "English once removed"; for it is all grown here in the United States. Center of American cultivation of European holly is in the Pacific Northwest, where the mild, moist climate most nearly resembles that of the rainy British Isles.

The real reason for urging purchase of glossy English holly instead of the native species is that the latter is gathered from trees growing wild in the woods, usually by unauthorized persons whose harvesting methods are hasty,

careless and destructive. The cultivated holly, on the other hand, comes from regularly established nurseries, and is the product of legitimate investment, management and labor. The less native holly we purchase, the fewer of our remaining American holly trees will be wrecked by looters of the woodlands.

If the price of American-grown English holly seems too high, there is an acceptable substitute in the "synthetic" Christmas greens made by combining the glossy evergreen leaves of mountain laurel with berry-covered twigs of one or another of the native holly species that shed their leaves in the fall. Mountain laurel is so abundant in the Eastern woods that no amount of Christmas plundering seems to make the slightest impression on it; and the bright-berried but leafless hollies, that rather favor swampy lands as habitat, are in no danger of extermination either. So most conservationists will at least tolerate these combination holiday decorations, even while they decry the despoliation of the true native holly itself.

If you live in any part of the country where native holly will grow (which means from New England to lower Michigan, south to Florida and Texas, together with most of the Pacific coast area) you can grow your own holly tree with very little trouble. All the larger nurseries stock them; or you can start your own cuttings if you like. This used to be nearly impossible, for holly twigs do not naturally strike root very easily.

However, synthetic growth hormones that will almost produce roots on a broomstick are for sale by all seed stores, and holly cuttings respond very readily to treatment with them.

*Science News Letter, December 12, 1942*

#### CHEMISTRY

### Chemical Industry Medal Presented to Dr. Howe

► **THE CHEMICAL** Industry Medal, one of the highest honors within the gift of chemical science, was presented to Dr. Harrison Howe of Washington, D. C., editor of *Industrial and Engineering Chemistry*, at a joint meeting of the American section of the Society of Chemical Industry and the American Institute of Chemical Engineers.

After the presentation, which was made by Dr. Lincoln T. Work, research director of the Metal and Thermite Corporation, the meeting was addressed by Dr. Gustavus J. Esselen, Boston consulting chemist, and Watson Davis, director of Science Service, who gave a sketch of Dr. Howe's life and told of his professional achievements.

Dr. Howe spoke on chemistry in international affairs, calling particular attention to the contributions by chemists in making America strong for war and prosperous in peace. He cited the work now going on in vitamin fortification of foods and in food dehydration, and recalled such chemical triumphs of the past as the breaking of the Japanese camphor monopoly through the development of a synthetic camphor, the release from dependence on German potash deposits through the opening up of American potash resources and the discovery of a cheap process for the production of toluene (basis of TNT) from crude oil.

*Science News Letter, December 12, 1942*

## Clip and mail this Coupon

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## • New Machines and Gadgets •

❁ **TOUGHENED GLASS** insulators for electrical transmission lines have been developed which will stand tensile loads up to 30,000 pounds. Ultimate strength could not be determined, it is claimed, because the special cap and pin fitted to permit the maximum possible load, broke during every trial, while the glass remained intact. Compressed surface and internal tension enable the glass to withstand heavy blows. But when it is broken or punctured, the insulator is completely shattered, permitting a faulty insulator to be easily located by visual inspection from the ground.

Science News Letter, December 12, 1942

❁ **A WEBFUL** of bombs for anti-aircraft use is the subject of a recent patent. A shell containing the apparatus bursts near the enemy plane, and releases the web with bombs attached. Becoming ensnared in the long strands of the web, the plane is brought down by the exploding bombs.

Science News Letter, December 12, 1942

❁ **A NEW FINISHING** agent for textile fabrics has been developed from petroleum. This replaces large quantities of sulfonated tallow formerly used. The tallow can now be used as a source of glycerin, a vital war material. Cost of the new finishing agent is said to compare favorably with materials formerly employed.

Science News Letter, December 12, 1942

❁ **AN ELASTIC YARN** with many of the characteristics of rubber has been produced synthetically and the present output is being used for military equipment. The new material, a vinylite resin, is said to be superior to rubber because it has better resistance to sunlight, tropical heat and humidity, and is not affected by body acids. Experiments indicate that the yarn can eventually be used to replace rubber in consumer goods, such as elastic webbing, women's girdles, suspenders, and surgical stockings.

Science News Letter, December 12, 1942

❁ **SILVERED GLASS** is replacing aluminum light reflectors formerly used for street lights, floodlights, searchlights and other equipment used in the war production program. A worker is shown applying silver in the form of the nitrate, to plain glass. A chemical change makes the silver stick to the glass but



eliminates other chemical ingredients. One company reports saving over a half million pounds of aluminum by this substitution.

Science News Letter, December 12, 1942

❁ **A NEW TYPE** of low-cost speed regulator will soon be placed on the market which will automatically keep the patriotic driver within the 35-mile limit.

Science News Letter, December 12, 1942

❁ **WALT DISNEY** fans may soon be startled to hear Donald Duck quacking above their heads, or a bee zooming at them through the audience. A newly patented method of sound reproduction would place loud speakers in the walls, ceiling, front and back of a theater.

Science News Letter, December 12, 1942

❁ **A GLOVE** which will fit either hand has recently been patented. The inventor claims that it is "neat, stylish and form-fitting," and that it can be sold singly, in pairs or in threes.

Science News Letter, December 12, 1942

❁ **AN OLD-FASHIONED** Gloucester fish net was substituted for war-scarce burlap by a leather tanning company, who needed a cotton material for increased friction on the pinch rolls of unhairing and fleshing machines. To their surprise, they found that fish net

## • RADIO

Saturday, December 19, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Watson Davis will review the highlights of the happenings in the world of science during 1942.

Monday, December 14, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"Mysteries of the Heavens" will be the subject of the program.

was more effective than any other cotton samples tried, and that it lasted 56 times as long as burlap.

Science News Letter, December 12, 1942

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 134.

Plastic "pearl" buttons made from casein can be improved by adding 2% potassium aluminum sulphate to the casein.

## ★ 2 TOP FLIGHT ERPI AVIATION FILMS! ★

### Problems of Flight

Describes use of plane's controls in taking off, climbing, banking, stalling, spinning and recovery, diving, gliding, landing. Superimposed animated diagrams clarify action of forces. Correct and incorrect techniques analyzed.

Uses: Practical applications, reference, direct teaching aid, instruction of basic principles.

### Theory of Flight

Illustrates application of physical laws to forces acting on airfoils. Wind tunnel tests demonstrate relation of air velocity to lift and drag on plain and cambered airfoils. Demonstration of control of plane movements (vertical, lateral, longitudinal axes) in pitching, rolling, yawing.

Uses: Illustration of scientific principles, stimulation of aeronautical enterprises, instruction in aerodynamics.

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# First Glances at New Books

► **MISSION COMPLETED** is the meaning of the bombardier's cry which provides the title for a new book written by John Steinbeck and illustrated with beautiful photographs by John Swope. **BOMBS AWAY** (Viking, \$2.50) tells the story leading up to that welcome cry which also means "It's time to go home." It is a story that begins long before the war in the days when the men of our Army Air Forces were high school boys with cut-down Fords which they kept going "with spit and wire long after they should have gone on the junk heap." These boys in high schools and on the farms "experimenting to get every last ounce of speed out of their aging motors, tinkering their carburetors to get every last possible mile out of their gasoline" know motors as few people in the world know them and Army instructors say they make the best possible flyers.

*Science News Letter, December 12, 1942*

► **BEHIND THE DRAMA** of lifesaving by treatment with sulfa drugs, blood plasma and skilled surgery of our wounded fighting men stand two highly complex and efficient organizations, the medical departments of the Army and Navy. **WHAT THE CITIZEN SHOULD KNOW ABOUT WARTIME MEDICINE**, by J. R. Darnall and V. I. Cooper (Norton, \$2.50), tells about these organizations and how they function to keep our fighting men fit and, if they should be wounded, to restore them to fitness as fast and far as possible.

*Science News Letter, December 12, 1942*

► **A CHEERFUL PROPHET** dips into the future when the war ends and foresees a world in which men, women and children of all the lands will have plenty to eat and to wear and comfortable homes in which to live. In **GOALS FOR AMERICA** (Twentieth Century Fund, \$1) Stuart Chase outlines a budget of needs and resources looking toward such a satisfactory state of affairs.

*Science News Letter, December 12, 1942*

► **SCIENCE, THE SLAVE**, can be put to work making "not a more deadly machine gun, not a more convenient refrigerator, but a more peaceful world." Dr. Karl Menninger, psychiatrist, tells in **LOVE AGAINST HATE** (Harcourt, Brace, \$3.50) how man's natural impulse to

master and to destroy can be profitably employed in suitable work and play, and how his equally natural love and tenderness can be better invested.

*Science News Letter, December 12, 1942*

► **FIRST ENGLISH EDITION** of an important work on air strategy is Giulio Douhet's **THE COMMAND OF THE AIR** (Coward-McCann, \$4) translated by Dino Ferrari. This book on the importance of airpower in the present war was published in 1930 by the Italian expert. Those interested in checking up on prophecies in the light of later events will be interested in the section of the book devoted to detailed description of the "War of 19...."

*Science News Letter, December 12, 1942*

► **PROPAGANDA**, news broadcasts, discussion programs and "This Is War" are some of the topics discussed in **RADIO IN WARTIME**, by Sherman H. Dryer, director of radio productions of the University of Chicago (Greenberg, \$3). Comments have been obtained for the book from several other authorities in the field.

*Science News Letter, December 12, 1942*

► **A PANORAMIC VIEW** of the universe, covering astronomy, chemistry, geology and physics, is offered college freshmen in **ATOMS, ROCKS AND GALAXIES** by John Stuart Allen and four other Colgate professors, revised edition, (Harper & Brothers, \$3.75).

*Science News Letter, December 12, 1942*

## Just Off the Press

**AERONAUTICS WORKBOOK** — Cornelius H. Siemans—Ginn, 174 p., \$1. Exercises in pre-flight training, clearly presented. Includes aeronautical study chart.

**BEFORE YOU FLY: Essentials of Aeronautics** — Pearle Thurber Robinson, Frederic A. Middleton, George M. Rawlings, and Joseph W. Phillips—Holt, 339 p., illus., \$1.08, school ed.

**BOMBS, BUILDINGS AND SHELTERS: ARP for the Home** — William H. Hayes—Columbia Univ. Press, 83 p., 60c. (Columbia Home Front Warbooks, No. 7).

**CHEMICAL ENGINEERS' MANUAL** — Donald B. Keyes and A. Garrell Deem—Wiley, 221 p., \$2.50. Professional edition.

**THE EARLY HISTORY OF SCIENCE AND LEARNING IN AMERICA**—*American Philosophical Society*, 204 p., illus., \$1.25. Proceedings: Vol. 86, No. 1. Papers read before the Midwinter meeting, Feb., 1942.

**ENCYCLOPAEDIA BRITANNICA WORLD ATLAS**: With physical and political maps, geographical comparisons. A glossary of geographical terms, a gazetteer index, and with geographical summaries, world spheres of influence. — Prepared by G. Donald Hudson, under the editorial direction of Walter Yust—*Encyclopaedia Britannica*, 126 color maps, 388 p., \$20.

**CONSERVATION FOR TOMORROW'S AMERICA**—Ollie E. Fink—*The Ohio Division of Conservation and Natural Resources*, 144 p., 50c.

**THE GEOLOGY OF CRATER LAKE NATIONAL PARK, OREGON**: With a Reconnaissance of the Cascade Range southward to Mount Shasta—Howel Williams—*Carnegie Institution*, 162 p., illus., \$2.50, paper; \$3.50, cloth.

**GLENN CURTISS: Pioneer of Naval Aviation** — Alden Hatch—Messner, 294 p., illus.,

\$2.50. For young people of high school and junior high school age. Foreword by John H. Towers, Vice-Admiral, U. S. N.

**HOW TO GET A RATING OR A COMMISSION IN THE ARMY, NAVY, COAST GUARD, MARINES, MERCHANT MARINE**—Bernard Galkin, comp.—Greenberg, 85 p., \$1. "Index to 300 jobs that fit you for the service."

**LOVE AGAINST HATE** — Karl Menninger — Harcourt, Brace, 311 p., \$3.50.

**MODERN CHEMISTRY** — Charles E. Dull — Holt, 628 p., illus., \$2. New edition.

**THE NATIVE TRIBES OF EASTERN BOLIVIA AND WESTERN MATTO GROSSO**—Alfred Métraux—*Smithsonian Institution*, 182 p., plates, 35c. Bureau of American Ethnology, Bulletin 134.

**OUR OLDEST FRIENDS**—Irmengarde Eberle—*Holiday House*, 147 p., illus., \$2. Histories of the dog, horse and cat traced through the centuries, charmingly written for young readers.

**RACE, REASON AND RUBBISH** — Gunnar Dahlberg — Columbia University Press, 240 p., \$2.25.

**SCIENCE IN PROGRESS**—George A. Baitsell, ed.—Yale Univ. Press, 322 p., illus., \$3; third series.

**SHIPBUILDING BLUEPRINT READING** — Joseph L. Tomlinson — American Technical Soc., 208 p., \$3. Loose-leaf workbook.

**VISUALIZED GENERAL BIOLOGY** — Andrew J. Burdick and Joseph J. Dudleston, edited by Harlan P. Freeman—Oxford Book Co., 378 p., 50c. Paper bound textbook with examination papers.

**WHAT THE CITIZEN SHOULD KNOW ABOUT WARTIME MEDICINE**—Joseph R. Darnall and V. I. Cooper—Norton, 237 p., \$2.50.

**YALE CLASSICAL STUDIES, Vol. VIII**—Austin M. Harmon and Alfred R. Bellinger, eds.—Yale Univ. Press, 178 p., \$2.